CS 561 Financial Informatics
Wednesday, 6-9PM
CGS-421 (871 Commonwealth Ave)

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Summary: **This course presents an overview of financial informatics. The course will begin with financial concepts such as markets, institutions and time value of money. This will be followed by an overview of the instruments traded and the information required to support the trading life-cycle. We will discuss the tools, data models and system architectures necessary to satisfy the various business systems. The class will next cover modern portfolio theory, risk management and performance measurement. It will conclude with security concepts and the challenges of security for financial information systems.**

Text:

No required textbook.

We will draw on the slides and some supplemental readings I will post on blackboard.

I will have suggestions on useful reference books and will bring some to class for those interested.

If you'd like a textbook, in the past I have used the following book. It covers only about ½ of the class material and the author's style is to include extraneous historical information, so I have stopped requiring it. It is inexpensive compared to other textbooks.

Introduction to Financial Technology, Roy S. Freedman, Academic Press, 2006.
ISBN-10: 0123704782 **ISBN-13:** 978-0123704788

Technology:

We will be using Microsoft Excel with several open source add-ins which will require the Microsoft Windows operating system. You will need access to a computer with this software in order to complete several of the assignments.

Grading:

20% Assignments
10% Quizzes
25% Midterm
25% Final
20% Project

Assignments are due at the beginning of class, no exceptions. This allows me to review the assignment with the class immediately.

Quizes and Exams are a mixture of multiple choice/true-false and short answer/worked math problem. On any short answer or math problem there is the possibility of partial credit, please take advantage of this opportunity.

Spreadsheet assignments may be submitted via the Blackboard dropbox or email to the instructor. Other assignments may be submitted using the above methods, or on paper at the beginning of class. If submitted electronically, I will print out some portion of your work and hand it back to you with comments, otherwise I will just mark-up your paper.

The project is a brief individual oral presentation to the class on a topic related to the class. Most students use some powerpoint slides, but there is no requirement to do so.

Cell and laptop policy:

No cell phone or laptop use is allowed in the class except for justified cases. These include handicapped individuals requiring a computer to take notes or to otherwise assist them in class and students requesting the use of a computer during a paper discussion session to illustrate specific points.

Academic Code of Conduct:

Cheating and plagiarism will not be tolerated in any Metropolitan College course. They will result in no credit for the assignment or examination and may lead to disciplinary actions.

Please take the time to review the Student Academic Conduct Code:
http://www.bu.edu/met/metropolitan_college_people/student/resources/conduct/code.html.

This should not be understood as a discouragement for discussing the material or your particular approach to a problem with other students in the class. On the contrary – you should share your thoughts, questions and solutions. Naturally, if you choose to work in a group, you will be expected to come up with more than one and highly original solutions rather than the same mistakes."

Weekly Topics

1/21/2015 - **Introduction to Financial Information Systems**
Readings: Casas, 2008; Yingsaeree, et al, 2010.
Review of Syllabus and selected topics
Review of Probability, Numerical Programming
Introduction to Financial Terminology
Using Microsoft Excel

1/28/2015 – **Algorithms and Tools**
Readings: McKinley and Levine.
Interpolation/Splines
Linear, Log linear ad Cubic

2/04/2015 – Algorithms and Tools
Root finding/ Solvers
Using Excel solver

2/11/2015 **– Time Value of Money, Interest, Term Structure of Interest Rates**
Readings: Investopedia Advanced Bonds.
Present Value/Future Value
Cashflow Conventions
Quiz 1(30 minutes)
Assignment 1(Bonds/Yield Curves) Handed Out (due 2/5)

2/18/2015 - **Financial Objects and Products (Bonds)**
Bonds/YTM/Duration
Term Structure of Interest Rates/Yield Curves

2/25/2015 - **Financial Objects and Products (Equity)**
Dividend Discount Model
Commodity Forwards

3/04/2015 — **Mid Term/Identification and Modeling**
Commodity Futures
Mid Term Exam (90 minutes)

3/11/2015 – **No Class – Spring Recess**

3/18/2015 **– Futures and Options**
Equity and Index Futures
Options introduced.

3/25/2015 - **Options**
Black Scholes
Binomial Model

4/01/2015 – **Trading Systems**
Identifying Financial Objects/Symbology
Market/Reference Data/Corporate Actions
Life Cycle of a Trade

Financial Networks/Protocols
Clearing and Settlement
Quiz 2 (30 Minutes)
Assignment 2 (Equities, Bonds, Futures, Forwards and Options) (due 4/09)

4/08/2015 - **Modern Portfolio Theory**
Mean Variance Optimization
Market Efficiency and CAPM

4/15/2015 – **Factor Models**
Factor Models
APT, Fama and French Model
Factor Models in Risk Management

4/22/2015 – **Risk Management**
Types of Risk in Financial Systems
Risk Management Cycle
Risk Management/Sensitivities
Risk and Hedging

4/30/2015 – **Presentations**
Project Presentations – each student (12-15 minutes)
Review

5/06/2015 **– Final Exam**
(120 Minutes)

If Time permits we will do following topics:
– **Performance Assessment**
Performance Measurement and Reporting
Return based style analysis
Benchmark selection and analysis
– **Security**
Security Threats
Security Mechanisms
Reliable Algorithms and Protocols
End to End security for Financial Systems